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ABSTRACT

This literature review examines studies in the field of metacognition and reading comprehension on the elementary level. It discusses sources in the areas of metacognitive theory, field experimentation, and specific learning and teaching strategies which have emerged from experimentation. The 25 sources are taken from published journals and ERIC documents. Metacognitive theory hypothesizes that reading comprehension is enhanced by the use of metacognitive strategies. Field experiments of this hypothesis show conflicting results. The controversy has not been resolved, but specific strategies (including activating prior knowledge, self-questioning, and teacher modeling) have been developed on the basis of positive experimental results. (Author/SR)

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Metacognitive Strategies for Teaching
Reading to Elementary Students

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Abstract

This review of literature examines studies in the field of metacognition and reading comprehension on the elementary level. It discusses sources in the areas of metacognitive theory, field experimentation, and specific learning and teaching strategies which have emerged from experimentation. The sources are taken from published journals and ERIC Documents. Metacognitive theory hypothesizes that reading comprehension is enhanced by the use of metacognitive strategies. Field experiments of this hypothesis show conflicting results. The controversy has not been resolved, but specific strategies have been developed on the basis of positive experimental results. Strengths and weaknesses, as well as indications for future research, are given.

Metacognitive Strategies for Teaching Reading to Elementary Students

This review of literature deals with metacognition and reading comprehension among elementary students. Reading is considered to be the key to further education, since students learn other content areas through the reading of specific content texts. Thus comprehension, which is defined as "an active process where the reader interacts with print clues to construct meaning," is vital to the learning process (McLain, 1991).

The learning process involves not only cognition, which James Alvino (1990) describes as basic mental skills such as "simple recall, analyzing the parts of a whole, recognizing cause and effect, comparing and contrasting, classifying, conceptualizing," but also involves metacognition, which is defined as one's ability to think about one's own thinking, or "one's knowledge concerning one's own cognitive processes and products" (Pesut, 1990). This review will discuss studies on current metacognitive theory, will review experiments conducted on metacognition, and will outline learning and teaching strategies that have evolved from those experiments.

Theory

Various synonyms for metacognition exist in the literature, including "reading awareness" (Paris &

Jacobs, 1984) and "metacomprehension" (Schmitt & Baumann, 1986). For the purpose of this review, the term "metacognition" will be used.

Metacognition contains two components that are essential to reading comprehension. These components are discussed succinctly in an article by Bonnie Billingsley and Terry Wildman (1990), which is representative of the literature on these components. The first component, metacognitive knowledge, is the awareness or knowledge on the learner's part of the skills and strategies necessary to perform cognitive tasks. The second component is the learner's ability to use self-regulatory behavior to complete those tasks.

Metacognitive knowledge involves declarative knowledge ("knowing that"), procedural knowledge ("knowing how"), and conditional knowledge ("knowing when and why"). Billingsley and Wildman, as well as Scott G. Paris and Janis E. Jacobs (1984), give well-researched and precise explanations of these areas of metacognitive knowledge, using primary and secondary sources. Paris and Jacobs further divide conditional knowledge into three categories of reasoning skill: evaluation, planning, and self-regulation.

This aspect of self-regulation is a very important part of metacognition. Control by the student, not the

teacher, is stressed across the literature. Irene W. Gaskins et al. (1988) summarize it well by stating that "the goal of reading instruction is to facilitate student independence in the construction of meaning." This independence is gained through such self-regulatory skills as goal-setting; self-incentives, and self-monitoring (Gentile & McMillan, 1987). Self-monitoring, or comprehension-monitoring, allows students to control their reading as they ascertain whether they understand what they read and select strategies to enable them to better comprehend the passage (Erickson et al., 1985). Control also allows students to comprehend future content passages by making them conscious of the mental processes involved and how to apply these processes to new situations (Duffy, Roehler & Herrmann, 1988). This last source is particularly relevant in light of current tests, such as the Maryland School Performance Test, which stress the process of applying what is known to new situations.

Metacognition, by its attributes of awareness and control, is an active process (Baird et al., 1991). Baird goes on to discuss metacognition in relation to cognition and affect; this study was not clear and terms were not operationally defined. Peter Johnston and Peter Winograd (1985) compare the active to the passive learner and give an explicit picture of passive failure.

Poor readers who exhibit helplessness do not use metacognitive strategies, are unaware of such strategies, and do not monitor their reading performances. This source has a thorough research base extending over four decades and including works from several domains.

The literature cited thus far provides a theoretical rationale for the topic of metacognition in elementary reading. Investigators have taken these concepts and proposed problems and hypotheses for experimental research.

Experiments

There is a controversy in the literature involving field experiments of metacognitive strategy training. One group of investigators claims results that prove metacognitive strategy training improves reading comprehension. The other cites results to refute this claim.

Let us first consider those experiments which yielded positive results. One experiment is relevant for teachers using the directed reading activity with basal readers. Douglas Lynch (1988) investigated whether listening, silent, or round robin reading conditions provided better comprehension. The treatment, which was adequately if not elaborately described, resulted in the finding that round robin

reading is detrimental to comprehension. It is also detrimental to metacognition, as it takes control away from the students and does not lead them to be aware of strategies or to use strategies in comprehension.

Elizabeth Short and Ellen Ryan (1984) investigated three questions: whether strategy-trained, less skilled readers differ from skilled readers in their ability to use story schemata (structure) to aid in comprehension; whether less skilled readers benefit from metacognitive strategy training; whether the benefits from strategy training are enhanced by attribution training. Their method, involving subjects, materials, and procedure, was replicable. However, there was no mention of a control group, which would invalidate the results if there actually were no control group and its omission were not merely an oversight in recording. Short and Ryan's results lead them to conclude that strategy-trained, less skilled readers do not differ from skilled readers in their ability to use story structure in comprehension; metacognitive strategy training aids comprehension; attribution training produces no effect.

Linda Gambrell and Ruby Bales (1986) hypothesized that mental imagery may facilitate the comprehension-monitoring process. They further hypothesized that mental imagery is most effectively used in poorly-understood texts. The investigators' design was clearly

identified, they had direct control of the treatment, and subjects were adequately selected. Their treatment could have been more differentiated. Gambrell and Bales concluded from their research that mental imagery is positively associated with comprehension-monitoring performance.

David Cross and Scott Paris (1988) did not explicitly state their hypothesis that metacognitive strategy training improves reading comprehension. Their treatment was different from other experiments in the literature, as it took place over a school year instead of several weeks or sessions. The investigators concluded that direct explanations about reading strategies increase student awareness and use of those strategies, and comprehension improves. In a different version of the same experiment, a clear research hypothesis was given, as well as some criticisms of metacognition (Paris, Cross & Lipson, 1984). These criticisms provide for a non-biased viewpoint that has been missing thus far in the literature. The investigators also admit to erroneous expectations in the testing and measurement portion of the experiment. Paris, Cross and Lipson suggest that standardized, norm-referenced tests of reading comprehension may be poor instruments to use for testing metacognitive strategy training.

All of the experiments cited above, with the exception of Lynch's round robin investigation, used error detection as a test of reading comprehension and cited positive results based on those error detection tests. However, this is controversial. Lawrence Erickson et al. (1985) cite their own research as well as others' to refute error detection testing as a valid method of testing metacognitive strategy. The investigators suggest other explanations for positive results.

K. Victoria McLain (1991) cites her results as refutation of the Paris & Cross results. She does agree with them, that standardized tests appear to be insensitive to metacognitive training, and discusses possibilities of why this is so. However, her results in the replicated study showed no differences between the effects of comprehension-monitoring strategies. Her research raises two questions which are grounds for further research. The first question asks whether strategy instruction teaches students to be better readers or just better strategy users. The second question asks whether metacognition is a late-developing skill, and if so, should teachers teach comprehension-monitoring strategies to early readers, or will the awareness actually develop as the readers mature.

This controversy has not been resolved with

conclusive experimental results. However, since many experiments do show positive results of metacognitive strategy training on comprehension, those strategies should be reviewed.

Strategies

The literature is full of different strategies, both learning and teaching, that promote reading comprehension. Most of the sources have a firm research base to support their position; less than 10% of the sources were what could be categorized as "recipe" instructions. Nearly 100% of the sources used the specific term, "strategy." This term is defined as a specific "learning-to-learn" skill (Kaplan, 1990). A strategy is differentiated from a technique, which becomes a strategy only if the readers have the knowledge of when, where, and how to use it (Crain, 1988). A strategy is not a basic reading skill. Both Irene Gaskins et al. (1988) and Anne Graves (1987) stress that prerequisite skills must be taught before metacognitive strategies. Sight vocabulary and decoding must be acquired before comprehension can develop, and metacognitive strategies are designed to improve comprehension, not basic skills.

One learning strategy mentioned quite frequently in the literature is activating prior knowledge. Linda Labbo and William Teale (1990) discuss how comprehension

is enhanced in storybook reading when students relate their personal experiences to the storybook situations, and when students predict what might happen next in the story, using background knowledge. Students who lack prior knowledge have no basis on which to make predictions or to interpret what they read (Billingley & Wildman, 1990). Maribeth Schmitt and James Baumann (1986) summarize this strategy concisely as they review how activating prior knowledge can be used in prereading, guided reading, and postreading activities.

Self-questioning is another strategy mentioned often in the research. It includes asking specific questions about the text as it is being read. SueAnn Crain (1988) deals specifically with self-questioning in storybook texts, while Billingsley and Wildman do the same with expository texts. Peter Dewitz et al. (1987) give a specific self-monitoring checklist as well as a rationale and research base for using self-questioning. Their rationale states that the self-monitoring checklist is "an external means of helping students internalize the cognitive procedures necessary to transfer the learned strategy to new reading situations."

Mental imagery is defined as "the creation of pictures in the reader's mind prior to, during, or after reading" (Fredericks, 1986). The investigator gives a brief research base to prove his assertion that this

strategy improves comprehension; the larger part of the study involves a sequence of activities including steps, stages, and guidelines. This study is practical for elementary reading teachers.

Other strategies listed but not thoroughly discussed in the research include setting purposes for reading, identifying important tasks, summarizing, paraphrasing, and recognizing sequence (Schmitt & Baumann, 1988). These are learning strategies that are implemented by the reader. Several teaching strategies are also cited in the sources.

One teaching strategy found throughout the literature is modeling. This strategy, also referred to as mental modeling, is an activity in which "the teacher externalizes for the students the mental processes involved in reading" (Labbo & Teale, 1990). Billingsley and Wildman (1990) explain it in simpler terms as "thinking out loud" as the teachers demonstrate how they work through a reading passage. Duffy, Roehler, and Herrmann (1988) actually model mental modeling, as they give examples and instructions in their research.

Semantic mapping and integrating reading and writing are two teaching strategies discussed in a balanced study by Elizabeth Burnett and Paul Berg (1987). Rather than totally dismissing basic skills instruction as a means of comprehension, as other

studies tend to do, these investigators advocate a combined approach of basic skills and metacognitive strategy.

Two final teaching strategies mentioned in the literature are peer tutoring and the use of the cloze procedure. Marie Perry (1991) investigated whether peer tutoring has an effect on reader comprehension and self-esteem. The investigator gives a non-biased review by stating that scores were not as high as expected. However, Perry does not propose reasons for the deficit. The cloze procedure has been shown to be an effective teaching strategy that trains students to integrate text information with prior knowledge (Dewitz et al., 1987). The results also show that the cloze strategy is very effective in yielding inferential comprehension of expository texts.

Certain learning and teaching strategies are suitable for story comprehension, while others promote the understanding of expository texts. Teachers have a variety of strategies from which to choose, as they seek to help students improve their reading abilities.

Summary and Conclusion

There is a wealth of information available in the field of metacognition and its relationship to reading comprehension. Qualitative and quantitative studies have been done, many of which support metacognitive

strategy training at the elementary level. However, there are a number of experiments that question the testing methods and instruments used to achieve those positive results, and there are other replicated experiments that do not achieve the same results. As the literature continues to evolve, it should include experiments which do not rely on standardized tests of comprehension; specific metacognitive strategy tests of comprehension should be made and used. The literature should also pursue the questions raised about whether strategy training produces better readers or better strategy users, and whether metacognition is a developmental skill that is naturally produced with age.

A weakness of the qualitative literature is that it shows bias, since it only speaks of the need for metacognitive strategy training without referring to the controversy found in the quantitative literature. The quantitative studies are more balanced, and the majority of sources have firm research bases. These are strengths. Another strength is the variety of specific strategies which are available, along with examples and materials, for implementation in the classroom. Their purpose is to enhance comprehension, which is the goal of reading instruction. When comprehension is improved, learning is facilitated in other content areas. This is the purpose of education.

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